Academic Calendar(20-21) prepared and adhered to:

Department of Mathematics

SI No	Hons/Gen	Paper	Group	Topic	No. of Lecture	Name of the Lecture
1.	Gen	1st Sem		Differential Calculus		
				Limit, Continuity and Differentiation	5	Concept of Limit
					2	Problems-Solutions
					1	Class test
					6	Continuity and discontinuity
					3	Problems- Solutions
					1	Class test
					6	Differentiation
					2	Problems-Solutions
					1	Successive Differentiation
					2	Leibnitz Theorem and its application
					1	Problem Solutions
					1	Class test
					4	Partial Differentiations
					2	Euler's Theorem
					4	Problem Solutions
					1	Class test

				Applications	2	Tangents and Normals
					2	Problems-Solutions
					1	Curvatures
					2	Problems-Solutions
					2	Asymptotes
					2	Problems-Solutions
					1	Singular Points
					2	Problems-Solutions
					5	Tracing of curves
					3	Tracing of curves
					1	Class Test
				Mean Value Theorem	1	Role's Theorem
					1	Problems-Solutions
					5	Mean Value Theorem
					3	Problems-Solutions
					2	Taylors Theorem
				Mean Value Theorem	1	Maclaurin's Theorem

					3	Maclaurin's Series
					2	Problems-Solutions
					4	Maximum and Minimum
					2	Problems-Solutions
2.	Gen	Sem 3		Real Analysis		
					3	Finite and infinite sets, Intervals, examples of countable and uncountable sets.
					5	Real line, bounded sets, suprema and infima, completeness property of R,
					2	Archimedean property of R
					4	Concept of cluster points and statement of Bolzano-Weierstrass theorem
					1	Class Test
					2	Real Sequence
					1	Bounded sequence
					2	Cauchy convergence criterion for sequences
					4	Cauchy's theorem on limits

					3	order preservation and squeeze theorem
					3	monotone sequences and their convergence (monotone convergence theorem without proof).
					1	Class test
					4	Infinite series
					2	Cauchy convergence criterion for series
					2	positive term series, geometric series
					3	comparison test,
					2	convergence of p-series
					2	Root test
					2	Ratio test
					4	alternating series, Leibnitz's test(Tests of Convergence without proof).
					5	Definition and examples of absolute and conditional convergence.
					1	Class test
					3	Sequences and series of functions
					5	Pointwise and uniform convergence

					3	Mn-test
					3	M-test
					8	Statements of the results about uniform convergence and integrability and differentiability of functions
					8	Power series and radius of convergence.
					1	Class Test
3.	Gen	Sem 5		Matrices		
					5	R, R2, R3 as vector spaces over R
					5	Basis and Dimension
					5	Concept of Linear Independence and examples of different bases
					5	Subspaces of R2, R3
					1	Class test
					5	Translation, Dilation, Rotation, Reflection in a point, line and plane
					4	Matrix form of basic geometric transformations.
					5	Interpretation of eigen values and eigen vectors

					4	Eigen spaces
					1	Class Test
					4	Types of matrices
					5	Rank of a matrix
					4	Invariance of rank under elementary transformations.
					4	Reduction to normal form,
					5	Solutions of linear homogeneous and non-homogeneous equations with number of equations and unknowns upto four
					1	Class Test
					1	Matrices in diagonal form
					5	Reduction to diagonal form upto matrices of order 3
					5	Computation of matrix inverses using elementary row operations
					5	Rank of matrix
					5	Solutions of a system of linear equations using matrices.
					5	Illustrative examples of above concepts from Geometry, Physics, Chemistry, Combinatorics and Statistics.

					1	Class Test
	Month: January 2021-April 2021					
4	Gen	Sem 2		Differential Equation		
					5	First order exact differential equations.
					5	Integrating factors, rules to find an integrating factor
					5	First order higher degree equations solvable for x, y, p
					5	Methods for solving higher-order differential equations
					5	Basic theory of linear differential equations
					3	Wronskian, and its properties
					3	Solving a differential equation by reducing its order
					1	Class Test
					5	Linear homogenous equations with constant coefficients
					6	Linear non-homogenous equations
					3	The method of variation of parameters
					3	The Cauchy-Euler equation

					10	Simultaneous differential equations
					3	Total differential equations.
					1	Class Test
					3	Order and degree of partial differential equations
					3	Concept of linear and non-linear partial differential equations
					3	Formation of first order partial differential equations
					6	Linear partial differential equation of first order,
					3	Lagrange's method
					3	Charpit's method
					5	Classification of second order partial differential equations into elliptic, parabolic and hyperbolic through illustrations only.
					1	Class Test
5	Gen	Sem 4		Group Theory		
					8	Equivalence relations and partitions, Functions
					1	Composition of functions

					1	Invertible functions
					5	One to one correspondence and cardinality of a set
					5	Definition and examples of groups, examples of abelian and nonabelian groups, the group Zn of integers under addition modulo n and the group U(n) of units under multiplication modulo n.
					3	the general linear group GLn(n,R), groups of symmetries of (i) an isosceles triangle, (ii) an equilateral triangle,(iii) a rectangle, and (iv) a square, the permutation group Sym (n), Group of quaternions.
					6	Cyclic groups from number systems, complex roots of unity, circle group
					1	Class Test
					8	Subgroups
					3	cyclic subgroups
					3	the concept of a subgroup generated by a subset and the commutator subgroup of group, examples of subgroups including the center of a group.
					5	Cosets, Index of subgroup, Lagrange's theorem
					2	order of an element

					6	Normal subgroups: their definition, examples, and characterizations
					3	Quotient groups
					1	Class Test
					12	Definition and examples of rings, examples of commutative and non-commutative rings: rings from number systems, Zn the ring of integers modulo n, ring of real quaternions, rings of matrices, polynomial rings, and rings of continuous functions
					5	Subrings and ideals
					12	Integral domains and fields, examples of fields: Zp, Q, R, and C. Field of rational functions.
					1	Class Test

Sl No	Hons/Gen	Paper	Group	Topic	No. of Lecture	Name of the Lecture
1.	Gen	6th Sem		Numerical Methods		
				Numerical Solutions	2	Concept and necessity of Numerical Methods
					2	Method of Tabulation
					2	Graphical method of solutions

					2	Bisection Method	
					3	False positions Method	
					3	Fixed Point Iteration Method	
					2	Newton's Method	
					3	Secant Method	
					3	LU Decomposition	
					3	Gauss Jacobi Method	
					3	Gauss Siedel Method	
					3	SOR iterative methods	
					3	Revision	
					1	Class Test	
				Interpolation	2	Concept of Interpolation and its uses	
					3	Errors in Interpolation	
					4	Operators	
					3	Newton's Forward Interpolation Formula	
					3	Backward Interpolation Formula	
					3	Lagrange's Interpolation Formula	

					4		Newton's Divided Difference Formula
					4		Central Difference Formula
					3		Revision
					1		Class Test
				Numerical Differentiation	3		Numerical Differentiation of Interpolating formulae
					2		Problem solutions
					1		Class Test
				Numerical Integration	3		Mechanical Quadrature Formula
					3		Trapezoidal Rule
					3		Simpson's 1/3 rule
					2		Revision
					1		Class Test
				Solution of Differential Equations	2		Numerical Solution of Differential Equation
					3		Euler's Method

					1	Revision
					1	Class Test